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The Indo-West Pacific Species of the Genus *Trigonostoma sensu stricto* (Gastropoda: Cancellariidae)

by

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Abstract. Three Indo-West Pacific species referable to the nominotypical subgenus *Trigonostoma* are compared and figured. *Trigonostoma antiquatum* (Hinds, 1843) is shown to have been misidentified in the literature, and *T. antiquatum* of most authors other than Hinds is newly described herein. The three Indo-West Pacific species recognized are: *Trigonostoma scalare* (Gmelin, 1791), *T. antiquatum* (Hinds, 1843) and *T. **thysthlon*** sp. nov.

INTRODUCTION

A study of the cancellariid subgenus *Trigonostoma s.s.* in the Indo-West Pacific reveals that there are three distinct species. The species identified in the recent literature as *T. antiquatum* (Hinds) is not that species, but a previously unnamed species, described herein as *T. **thysthlon*** sp. nov. The lectotype of *T. antiquatum* is figured, the first time it has been illustrated photographically.

ABBREVIATIONS

Abbreviations for museum collections cited in this paper are: AMNH, American Museum of Natural History, New York; ANSP, Academy of Natural Sciences of Philadelphia; BM(NH), British Museum (Natural History), London; MHNG, Muséum d'Histoire Naturelle, Genève; MNHN, Muséum National d'Histoire Naturelle, Paris; NSMT, National Science Museum, Tokyo; USNM, National Museum of Natural History, Washington.

SYSTEMATICS

Genus *Trigonostoma* Blainville, 1827

Trigonostoma BLAINVILLE, 1827:652.
Type species (monotypy) *Delphinula trigonostoma* Lamarck, 1822 [=*Buccinum scalare* Gmelin, 1791].
Trigona PERRY, 1811:pl. 51, non *Trigona* Jurin, 1807.

Subgenus *Trigonostoma s.s.*

Trigonostoma scalare (Gmelin, 1791)

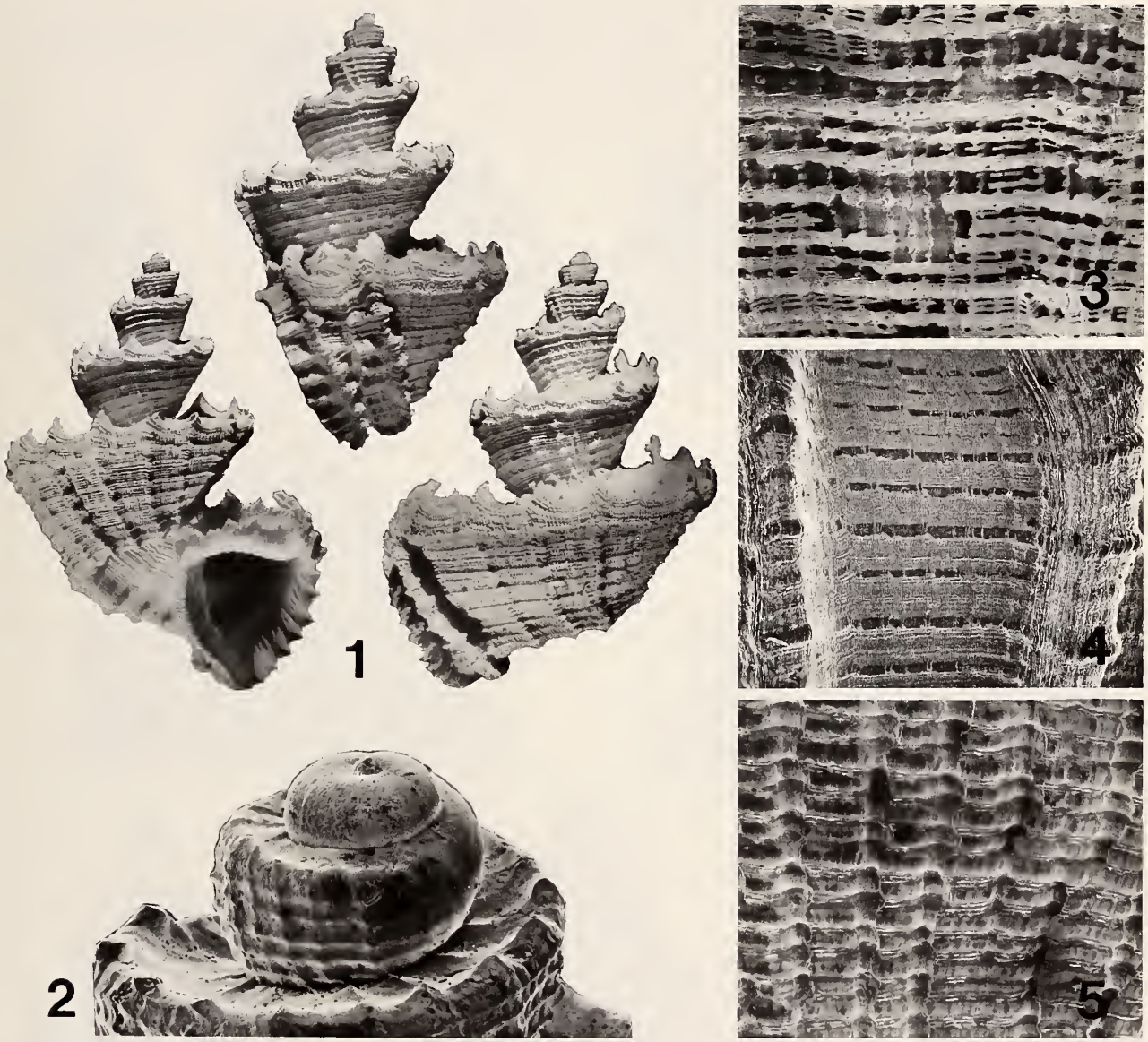
(Figures 1–3)

Buccinum scalare GMELIN, 1791:3495.
Trigona pellucida PERRY, 1811: pl. 51, figs. 1, 2.
Delphinula trigonostoma LAMARCK, 1822:231; BLAINVILLE, 1827:652; MERMOD & BINDER, 1963:170, fig. 234.
Cancellaria trigonostoma (Lamarck): DESHAYES, 1830:180; SOWERBY, 1833:7, fig. 44; KIENER, 1841:41, pl. 1, figs. 1, 1a; DESHAYES, 1843:409; SOWERBY, 1849b:457, pl. 94, figs. 45, 46; REEVE, 1856, pl. 11, figs. 51a–b; TRYON, 1885:78, pl. 5, fig. 79; LÖBBECKE, 1886:50, pl. 15, figs. 1, 2.
Trigonostoma pellucida (Perry): PETIT, 1967:217; ABBOTT & DANCE, 1982:229 [figured].
Trigonostoma antiquata (Hinds): GARRARD, 1975:20, pl. 3, fig. 16 [not of Hinds].
Trigonostoma trigonostoma (Deshayes): CHENU, 1859:276, fig. 1828; KIRTISINGHE, 1978:79, pl. 45, fig. 5.
Trigonostoma scalare (Gmelin): PETIT, 1984:58; VERHECKEN, 1986:59, fig. 27.

Diagnosis: *Trigonostoma scalare* may be readily distinguished from its congeners by its large size, concave sides, and characteristic imbricate sculpture (Figure 3).

Range: Sri Lanka to the Philippines, southeast to northeast Australia.

Remarks: The nomenclatural history of this distinctive species has been given by PETIT (1984). GARRARD (1975: 20) misidentified the species as *Trigonostoma antiquata* (Hinds) and later (1983:6) considered *T. antiquata* to be a synonym of *T. trigonostoma*, compounding his error by attributing the latter name to "Linnaeus, 1758."



Explanation of Figures 1 to 5

Figures 1, 2. *Trigonostoma* (*Trigonostoma*) *scalare* (Gmelin, 1791).

Figure 1. USNM 845609, taken by nets in 73 m, off Balut Is., Mindanao, Philippines. ×2.5.

Figure 2. Protoconch of specimen in Figure 1. ×50.

Figure 3. Detail of surface sculpture of specimen in Figure 1. ×50.

Figure 4. *Trigonostoma* (*Trigonostoma*) *antiquatum* (Hinds, 1843). Detail of surface sculpture of paralectotype BM(NH) 1968416/2, "Island of Corregidor, Manila Bay, Philippines." ×50.

Figure 5. *Trigonostoma* (*Trigonostoma*) ***thysthlon*** sp. nov. Detail of surface sculpture of specimen in Figure 8. ×50.

Early locality citations for this species were given simply as "Ceylon." The Australian records given by GARRARD (1975:21) cannot be accepted in their entirety owing to his misidentification. However, his figured specimen (pl. 3, fig. 16), definitely *Trigonostoma scalare*, is stated to be from "3 metres off Black Is., Whitsunday Group, Qld." In the past few years specimens have been taken from tangle nets off Bohol Island, central Philippines. VERHECKEN (1986: 59) reported a specimen from the Moluccas.

The location of the type of *Trigonostoma scalare* is not known. Gmelin based the name on an illustration in a Meuschen sales catalog (see PETIT, 1984:58) and the disposition of that specimen is not known. The location of the type of Perry's *T. pellucida*, stated to be in "Miss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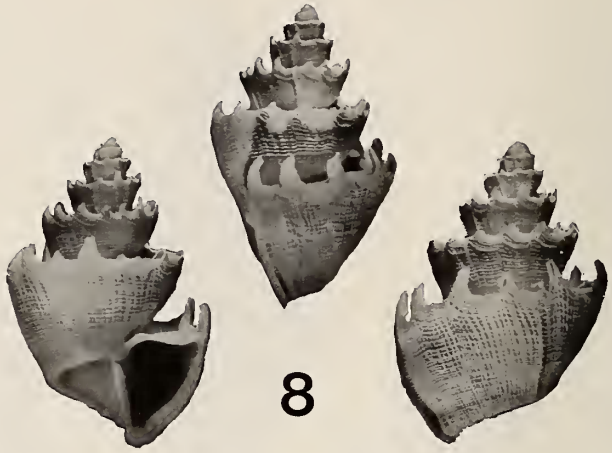
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Mitford's collection," is also unknown. MERMOD & BINDER (1963) described and figured the holotype of *Delphinula trigonostoma* Lamarck, which is in MHNG.

Trigonostoma antiquatum (Hinds, 1843)

(Figures 4, 6, 7)

Cancellaria antiquata HINDS, 1843:49, 1844:43, pl. 12, figs. 17, 18.

Cancellaria antiquata Hinds: SOWERBY, 1849b:458, pl. 93, fig. 27; REEVE, 1856, pl. 16, figs. 74a, b; TRYON, 1885: 79, pl. 5, fig. 88; LÖBBECKE, 1886:57, pl. 16, figs. 9, 10.

Not *Trigonostoma antiquatum* (Hinds): HABE, 1961a:435, pl. 24, fig. 14; pl. 23, fig. 8; 1961b:73, pl. 36, fig. 8; LAN, 1980:95, pl. 41, figs. 93, 93a; ABBOTT & DANCE, 1982: 229 (all =*T. **thysthlon*** sp. nov.).

Not *Trigonostoma antiquata* (Hinds): GARRARD, 1975:20, pl. 3, fig. 16 (=*T. scalare* (Gmelin, 1791)).

Trigonostoma antiquata (Hinds): VERHECKEN, 1986:60 (in part).

Diagnosis: This species may be recognized by its smoothly convex whorls as well as by the presence of about 9 evenly spaced varices per whorl. Intervarical surface sculpture (Figure 4) consists primarily of numerous spiral ridges of irregular size.

Range: Along northern Indian Ocean to New Guinea. Philippines?

Remarks: In his original description HINDS (1843) gave the locality as "New Guinea; in twenty-two fathoms, coarse sand." He further stated that it had been "also observed by Mr. Cuming at the island of Corregidor, Bay of Manila, in seven fathoms, coarse sand." The next year Hinds gave only New Guinea as the habitat, not mentioning the Cuming specimens. The Hinds material was not deposited in the BM(NH) and its location is not known, leaving only the Cuming specimens to serve as type material. The British Museum (Natural History) has the Cuming specimens (BM(NH) 1968416) from which VERHECKEN (1986:60) selected as lectotype BM(NH) 1968416/1 (Figure 6), the remaining two specimens (1968416/2–3) becoming paralectotypes. The Philippine locality given for the Cuming specimens is suspect, as additional specimens have not been found even though the Corregidor Island area has been well collected. The possibility of incorrect locality data cannot be ignored, especially as other Cuming material stated to be from the Philippines, such as *Cancellaria semidisjuncta* SOWERBY (1849a), has been shown to be from localities far removed from the Philippines. All Philippine specimens of *Trigonostoma s.s.* that have come to our attention are assignable to either *T. scalare* (Gmelin) or to *T. **thysthlon*** sp. nov. described herein. VERHECKEN (1986: 60) cites *T. antiquatum* as occurring in India, the Strait of Hormuz, and the Gulf of Oman. We have examined several additional specimens from the northwestern Indian Ocean. These have regular varices and surface sculpture characteristic of *T. antiquatum*, although the shells tend to be thinner and less convex.

Table 1

Trigonostoma (*Trigonostoma*) ***thysthlon*** sp. nov. Measurements of shell characters. Linear measurements in mm. $n = 5$.

Character	Mean	SD	Range
Shell length	20.0	2.6	16.3–23.7
Shell width	13.0	1.5	10.9–15.6
Aperture length	8.0	1.0	6.4–9.5
$\frac{\text{Aperture length}}{\text{Shell length}}$	0.40	0.01	0.39–0.42
No. whorls, protoconch	1.95	0.19	1.75–2.25
No. whorls, teleoconch	5.0	0.22	4.75–5.2
Spire angle	60.7	4.9	54–69

Trigonostoma (*Trigonostoma*) ***thysthlon***
Petit & Harasewych, sp. nov.

(Figures 5, 8–13, Table 1)

Description: Shell small, reaching 24 mm in height, conispiral, deeply umbilicate. Protoconch (Figure 9) of 2 smooth whorls, deflected slightly from coiling axis. Transition to teleoconch delineated by fine lamellose varix with short open spine at the shoulder followed by onset of spiral

←

Explanation of Figures 6 to 13

Figures 6, 7. *Trigonostoma* (*Trigonostoma*) *antiquatum* (Hinds, 1843).

Figure 6. Lectotype, BM(NH) 1968416/1, "Island of Corregidor, Manila Bay, Philippines." ×2.5.

Figure 7. Protoconch of paralectotype BM(NH) 1968416/2. ×50.

Figures 8–13. *Trigonostoma* (*Trigonostoma*) ***thysthlon*** sp. nov.

Figure 8. Holotype, USNM 747301, in 56–73 m, off west coast of Wasir Is., West Wokam, Aru, Moluccas (5°30'S, 134°12'E). ×2.5.

Figure 9. Protoconch of specimen in Figure 8. ×50.

Figure 10. Paratype, Petit collection, in 15–20 m, Rio Cordo Del Sur, Philippines. ×2.5.

Figure 11. Paratype, Petit collection, in 182 m, S of Makung Is., Taiwan. ×2.5.

Figure 12. Paratype, NSMT 63633, in 90 m, off Wakayama Prefecture, Japan. ×2.5.

Figure 13. Paratype, MNHN, in 143–178 m, off NW Mindoro, Philippines (13°59'N, 120°14.5'E). ×2.5.

sculpture. Teleoconch with up to 6 tabulate whorls. Suture deeply impressed. First 2 postnuclear whorls with 11 or 12 finely lamellose varices per whorl. Thereafter 11 or 12 open shoulder spines per whorl, varices absent. Two thick varices in close apposition appear to mark the end of growth in adult specimens. Surface sculpture (Figure 5) of intersecting axial and spiral elements, with the axial elements being more prominent and consisting of fine, rounded riblets. Spiral sculpture of numerous weak cords, each composed of 2 or 3 fine threads. Aperture roughly triangular. Siphonal canal very short, forming shallow indentation in abapical corner of aperture. Outer lip of adult specimens with 12–15 thin lirae between the double-varix, smooth in subadults. Posterior portion of inner lip adpressed against siphonal fasciole. Inner lip with 2 columellar and 1 siphonal folds. One additional columellar thread occasionally occurring between the two columellar folds in large adult specimens. Umbilicus deep, reaching protoconch. Shell color white to pinkish brown. Aperture white. Internal structure, periostracum, and soft parts unknown.

Holotype: USNM 747301, in 56–73 m, off west coast of Wasir Island, West Wokam, Aru, Moluccas (5°30′S, 134°12′E), M. King Memorial Exp. sta. AWI 9P10, L = 16.5 mm.

Paratypes (8): Petit collection, in 15–20 m, Rio Cordo Del Sur, Philippines, L = 21.9 mm; Petit collection, in 182 m, S of Makung Is., Taiwan, L = 24.2 mm; NSMT 63633, in 90 m, off Wakayama Prefecture, Japan, L = 19.3 mm, 20.7 mm; MNHN, in 143–178 m, off NW Mindoro, Philippines (13°59′N, 120°14.5′E), L = 18.4 mm; ANSP 234758, in 90 m, Wakayama, Japan, L = 16.5 mm; AMNH 161104, off Kii Peninsula, Honshu, Japan, L = 23.5 mm; AMNH 122818, off Kii, Honshu, Japan, L = 16.5 mm.

Range: Southern Japan south to the Philippines.

Comparisons: This species most closely resembles *Trigonostoma antiquatum* from which it may be distinguished by its lack of pronounced varices beyond the second postnuclear whorl. Its flat or slightly convex whorls further distinguish it from *T. antiquatum* which has rounded whorls. The surface sculpture of *T.* ***thysthlon*** consists of strong axial and weaker spiral cords, while the surface sculpture of *T. antiquatum* consists of strong spiral and very weak axial cords.

Etymology: From the Greek *thysthlon,* a torch carried in the Bacchic festival.

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Mr. Donald Dan, West Friendship, Maryland, photographed numerous specimens of *Trigonostoma* in foreign museums at our request. Dr. Akihiko Matsukuma, National Science Museum, Tokyo, Dr. Robert Robertson, Academy of Natural Sciences of Philadelphia, Dr. Philippe Bouchet, Muséum National d'Histoire Naturelle, Paris, Dr. William K. Emerson, American Museum of Natural History, New York, and Ms. Kathie Way, British Museum (Natural History), London, all made available material from their museums' collections. Mr. Ron Parsons, Burlingame, California and Mr. P. W. Clover, Glen Ellen, California, loaned specimens from their personal collections. Mr. André Verhecken, Mortsel, Belgium, corresponded and furnished a photograph of *T. antiquatum* from the Strait of Hormuz. To all of the above we express our appreciation for their assistance and cooperation.

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